TITLE OF THE ABSTRACT: A MORPHOLOGICAL STUDY OF ACUTE MYELOID LEUKEMIA AND CORRELATION WITH CLINICAL AND LABORATORY FINDINGS, INCLUDING RESULTS OF CYTOGENETIC ANALYSIS AND MUTATION SCREENING.

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Objectives:

- To **describe the morphology** of bone marrow aspirates **in acute myeloid leukemia(AML).**
- To **correlate** the bone marrow morphology **with results of cytogenetic analysis and mutation screening.**
- To **categorize AML** using both the French-American-British(**FAB**) and the World Health Organization(**WHO**) **classification** systems

Methods:

- A total of **156 newly diagnosed cases** of AML presenting to Christian Medical College, Vellore over a period of **one year** from January 2015 to December 2015 were included in this study.
- Bone marrow aspirate smears and peripheral blood smears of 156 patients with AML were studied and findings such as differential count, blast lineage assessment and assessment of dysplasia were noted.
- Laboratory haematological parameters such as haemoglobin, platelet count and total leucocyte count were assessed for all the patients.
- Cytogenetic analysis using karyotyping was carried out in **142** of the 156 patients.
- Mutation screening for NPM1, FLT3-ITD and FLT3-TKD genes was carried out for **47** patients.

Results

- The **median age** of the patients was **32 years** (range: 7 months to 76 years).
- Using the **FAB classification**, the most common subtype was **AML-M2(37%)** followed by AML-M1(21%). AMl-M6(1%) was the least common subtype.
- **Cytogenetic analysis –**
    - **Abnormal karyotypes** were seen **62%** of our patients.
    - **(15;17)(q22;q12)** was the most common recurrent genetic abnormality observed. t(8;21)(q22;q22.1) was seen in 8% patient. Rest of the abnormalities were seen in ~1-2% of patients.
    - Other common cytogenetic abnormalities observed were
        - Trisomy 8 – 9%
        - Monosomy 7 – 8%

- Complex karyotypes (3 or more abnormalities) – 13%
- Monosomal karyotypes – 9%.

- **Mutation screening –**

    - **NPM1 mutation** was seen in **47% (22/47)** patients, and in 74% (20/27) patients with normal karyotype.
    - FLT3-ITD mutations were seen in 19% (9/47) of patients.
    - FLT3-TKDmutations were seen in 17% (8/47) of patients.
    - Concomitant NPM1 and FLT3 mutations were concomitantly seen in 28% (13/47) of patients

- Using the **2016 revision to the WHO classification of AML–**
    - **AML with recurrent genetic abnormalities** (AML-RGA) accounted for **42%** of patients.
    - **AML, not otherwise specified** (AML, NOS) accounted for **37%** of patients.
    - **AML with myelodysplasia-related changes**(AML-MRC) accounted for **21%** of patients
        - AML-MRC based only on morphological evidence of dysplasia - 23%.
        - AML-MRC based on morphology and /or cytogenetic changes - 77%.

- **Risk classification** according to modified European LeukemiaNet(ELN) classification system –

    - **Favorable** risk profile was seen in **37%** of patients.
    - **Intermediate** risk profile was seen in **38%** of patients
    - **Adverse** risk profile was seen in **25%** of patients.

Key words: Acute myeloid leukemia, AML, FAB classification, WHO 2016 classification, cytogenetics, NPM1, FLT3-ITD, FLT3-TKD, ELN classification.